

Forecast

1957



CHRISTMAS 1956

PUBLISHER'S PAGE

IVERY author, with few exceptions, thinks that his writings are "for posterity," and that they will last for all time—when, as a matter of fact, *nothing lasts forever*, not even our 4½ billion year old Earth.

Newsprint, unless kept in a vacuum, or in a special gas, crumbles to dust in much less than 75 years. Good rag-paper books may average 250 to 400 years. *Very high grade* parchment records may last 8,000 to 10,000 years before they fall to pieces. The Declaration of Independence, written on parchment 180 years ago, is now preserved between plates of thick glass in a helium atmosphere, but, alas, the ink is badly faded. It must be restored soon.

Well, our hypothetical author asks, *what* does last longest? Stone tablets are excellent, if not exposed to the elements. If made of granite, they may last a hundred thousand years. Metal plaques, too, if kept dry, may last 250,000 years although dust, grime and oxygen will make much of the surface illegible. Nor would one print a 300,000-word book on metal plaques!

But, says the knowing author, modern man preserves his writing by means of microfilm. Quite true, but even the best film, unless preserved in a special atmosphere, won't even last 2000 years. Chemical changes in the film's emulsion destroy it comparatively soon. Film itself becomes brittle in less than 500 years.

What then can we do? Plastics in time could be made to last 25,000 years but too little is known about them as yet. This leaves us with certain chemically pure metals that could last one million years. Metal sheets could be "printed" in *raised type*—in relief. Such a book would have to be kept in a vacuum too.

I dragged in all this ponderous scientific stuff to demonstrate to you that when *tempus fugit*, it phfts real fast. If you take this page after a hundred years you won't be able to read it—it will have turned to dust!

I—the hypothetical author—am properly and deservedly humbled when I reflect how shortlived my literary (?) scribbling really is. This, you will applaud, is good for the soul, as it also puts me in the proper holiday spirit.

Imbued with these lofty thoughts, may I therefore, as I have for the past 48 years, extend my ephemeral hand and shake yours with my most sincere and heartfelt wishes for 1957, plus

A Very Joyous Christmas

And a Happy and Prosperous New Year

HUGO GERNSBACK

Despite it All, Your Editor and Publisher Since 1908.

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SEXOLOGIA MAGAZINE (in Spanish)

Entire contents originated and written by Hugo Gernsback

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Editorial

**CANDLES—
TERRESTRIAL
and
CELESTIAL**

A
cu-
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ous
fact
about

the can-

dle is its almost total rejection by us. Gas and electricity have made it nearly obsolete after a vogue of 10,000 years. Today's use is religious and festive. Backward countries use them too. ¶ Early candles consisted of dried plant pith soaked in fat. The pith was the wick. Later, flax was used for wicks. Beeswax candles were made since earliest times and often mentioned by Roman writers. Required by our forebears for all lighting purposes after sundown, they were needed, too, where sunlight could not penetrate. ¶ Chiefly the candle is venerated for its *intellectual light* brought to man's knowledge, his progress and rise. By candlelight men studied, laboring through the nights to improve the race. It served all great minds of the past. Plato, Caesar, Bacon, Charlemagne, Newton, Goethe—all studied by candlelight. Shakespeare lauds the candle, too:

"How far that little candle throws his beams! So shines a good deed in a naughty world." ¶ It is symbolically fitting that the candle should have a celestial counterpart that lights the heavens. They are the colossal candles of the Universe, the comets. ¶ For billions of years, long before man's advent on Earth, they have visited us. Early man was terrorized by comets—they were an evil omen.

Most are too faint to be seen. Today we know they have a small head with a luminous tail hundreds of thousands of miles long. The tail turns from the Sun which lights it, as does electrical excitation. Comets are no rarity. Astronomers discover them constantly. The last one, 1956-H, was found Nov. 6. ¶ While spectacular, comets don't flame often in our skies, yet *man-made* comets will become a future commonplace. With spaceflight a reality, huge sky candles will be feasible. By using low-cost chemicals, spaceships can manufacture easily ejectible gas. When the ejection nozzle is electrified by high-tension currents, a long, luminous tail streams from the spaceship. Its importance: Miles-long, it can be seen and followed from Earth; the small ship cannot. Nor need the tail be visible constantly—it can be illuminated intermittently by the pilot. The long, colorful tail will also prevent future spaceship collisions.

TEST-BOMBS ON THE MOON

THE current controversy whether we should or should not test H-bombs is likely to continue for a long time to come. Unfortunately, there seems so far no assurance that nations will ever agree upon a practical plan

to outlaw atomic bombs. Even if they did, it would solve nothing whatsoever.

Clandestine tests could still be made in the huge underground caves which abound in many parts of the world. Because they are sealed off from the outside atmosphere, no radioactive fallout could be detected in other countries. Nor does it make any difference if large or baby type bombs are so tested, because, with technological progress, H-bombs may become so "clean" that they will emit little or no dangerous radiation.

For war purposes, bombs in the main should be as destructive as possible, in theory. Radioactive fallout is not always desirable—the en-

emy may want to occupy the bombed city later. If it is highly radioactive, he will not be able to enter it for perhaps a long time. In the end, war is never waged for the sake of deadly radiation alone. Sooner or later, the "conqueror" must occupy the vanquished area for mop-up operations and to exploit his former enemy. If all the big centers are "hot" and poisoned for perhaps years, he stands to lose more than he gains.

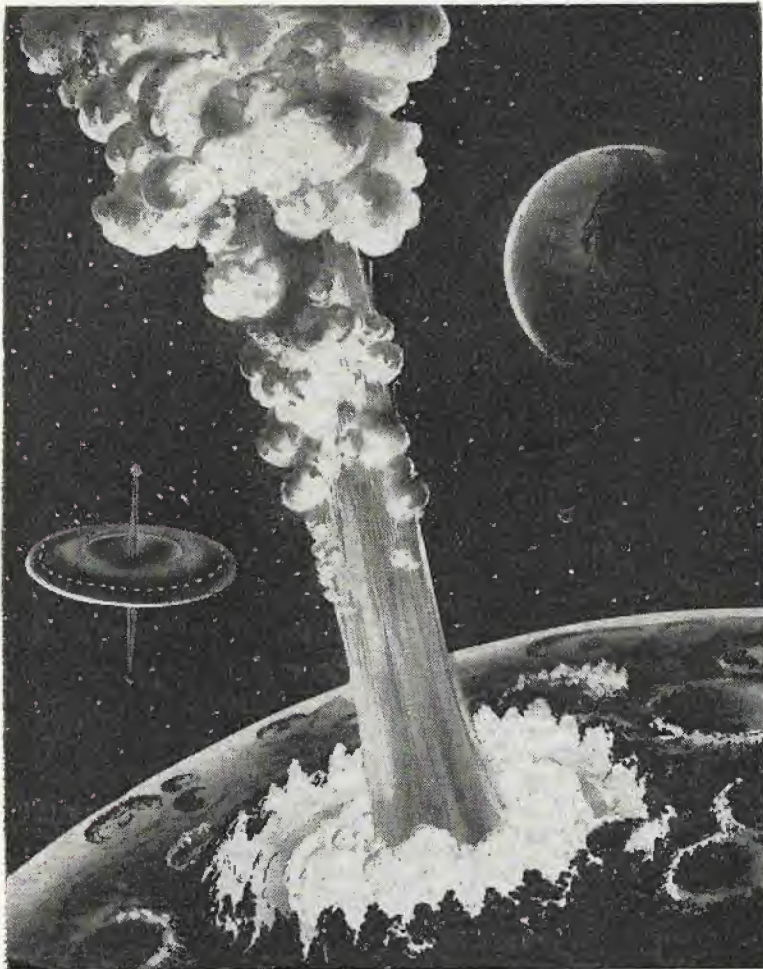
● As for testing present and future super-bombs, in my opinion the radioactive bugaboo is a vast exaggeration. I am certain that the present rate of testing H-bombs can go on for the next 20 years without affecting the health of the present world population or our descendants. The plain fact is that all current opinions are pure guesswork—one group of scientists is positive of the great danger of continuous tests; the other scoffs at it.

One fact, however, stands out in all the controversy: for billions of years, the Earth has been bombarded with all sorts of dangerous radiation—including the most dangerous of all, cosmic rays and X-rays. This colossal

bombardment goes on continuously and, while it is true that our atmosphere screens a percentage of the radiations, far more comes down to earth than the effect of thousands of H-bombs if they were all exploded simultaneously.

● Far more dangerous, to my mind, is the continuous pollution of our atmosphere by the noxious gases generated all over the world, especially near large industrial centers, by the automobile and the incinerator. These hydrocarbons and other poisonous gases vitiate our atmosphere so rapidly that it is becoming more and more saturated as time goes on. Many medico-scientists are convinced that the rise of pulmonary cancer is directly attributable to the increasing hydrocarbon content of the air we breathe. If a change is not effected soon, they maintain, the index of respiratory cancer must increase inevitably.

Shall we go on with our present cumulative air pollution till all our cities have become smog centers like Los Angeles? Fortunately, there is no necessity for such an outlook. We *do* have the means to rid our atmosphere of an excessive content of hydro-



View of H-Bomb explosion on airless Moon in the center of huge crater. Earth is to right. Space ship is on the left.

carbon before it reaches the universal fatal state. The answer of course is atomic power—now in its infancy—which, curiously enough, brings us right back to H- and other bomb testing!

● The atomic power—such as it is—which we use today is childish, to say the least. We have not as yet learned how to use atomic power efficiently. Actually, we now utilize only a tiny fraction of the titanic power inherent in the atom. The flea power we use now is really a *by-product* of atomic energy—heat. We use this heat in a boiler to make steam, then run a steam engine with it, which finally operates an electric generator, giving us the electric current we want!

● Yet scientists, since the Curies discovered radium in 1898, have known that the atom gives out radiation which is electromagnetic. Why not capture this powerful radiation and convert it *directly* into electricity? I have recommended this since 1915,* 41 years ago. In a theoretical illustration, I showed graphically how if we utilized all its inherent energy at one stroke, *one-fiftieth of a gram* of radium—a

*See "The Wonders of Radium," in the writer's magazine *The Electrical Experimenter*, September, 1915, issue.

mere speck—could by means of a super electromagnet lift the 103,000-ton Woolworth Building 1 foot off the ground!

Since that time we have discovered the atomic bomb and atomic power, but *direct electric power from the atom* is still far off simply because research in this direction has not been persevered at with effort equal to that for the A-bomb during World War II.

As time goes on, more and more of the present atomic classified information becomes public property. Yet many scientists would deplore the cessation of all atomic tests at this time. They feel rightly that without occasional tests, scientific progress will be retarded for years. New facts are discovered in nearly every test explosion, large and small.

● Nor is there any foreseeable end to *new types* of atomic bombs. The A- and H-bombs are but a beginning. The uranium-plutonium and hydrogen types are only forerunners because at the time they were designed they were the easiest to make in a new art.

They will be followed in due time by others for special purposes. They need not necessarily be more powerful, more destructive nor more radioactive.

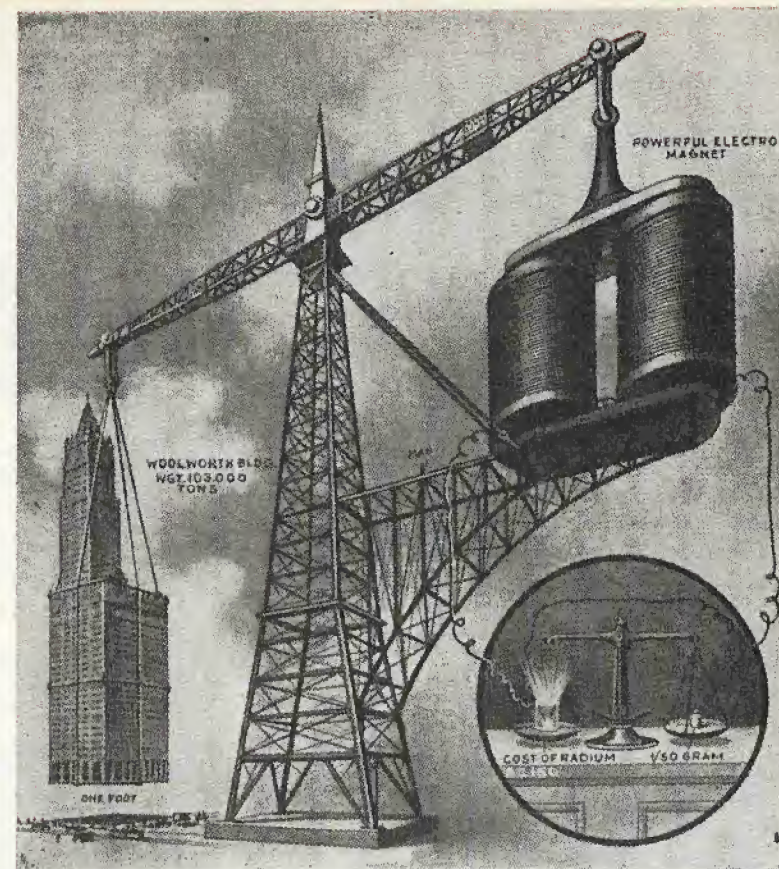
But there is one certainty: they

cannot be evolved without actual tests. And the more types we evolve, the more tests will be required.

Sooner or later, from such tests, true electrical atom power will emerge and may well revolutionize the world. It will do away with war because it will give the impoverished have-not countries abundant cheap power.

I agree too that, as time goes on, it may no longer be wise or safe to continue large-caliber bomb tests on Earth because there *may* be a radiation hazard, particularly in testing new and at present unknown bombs which may be far more deadly than anything we can conceive of today. Happily, when that time comes, there will be a solution to the problem.

● By that time—let us say about 1975—space flying will be in full



41-year-old illustration showing how 1/50 gram of radium could lift Woolworth Building one foot, if radium's atomic energy was instantly released.

swing, with trips to the moon almost a certainty. And what an ideal testing locale the moon offers the physicist! No atmosphere to bother with, no population to worry about. Bombs can be set off from the thick dust-blanketed ground to suck up into the sky for hundreds of miles immense atomic "mushrooms" that will dwarf our mightiest H-explosion on Earth.

Or we can set off bombs from

the high lunar mountains for different tests. There being no atmosphere nor winds, the fallout will begin to rain down directly over the test site within hours. Because of the lesser gravity on the moon the light particles of the fallout will come down slowly but steadily. The resulting deposit can then be scooped up from the ground for analysis.

Naturally such testing will be done only on selected sites, perhaps on the other side of the moon or in the protective shelter of large, walled crater sites. As such test grounds may stay "hot" with dangerous radiation for years, they will be known by all scientists as danger areas.

What will be the difference between a lunar and a terrestrial atomic explosion? On Earth the explosion is followed immediately by severe atmospheric shock waves and heat waves. Witnesses customarily cover their ears, even if they are miles away, so that their eardrums may not be broken.

On the moon, the explosion

produces no shock waves and there is no direct sound because there is no air. Nevertheless, the sound travels through the moon's ground and those that stand on it will be aware of some sound and vibration as both travel up through the legs and body. The observers, too, will feel the onslaught of the heat wave as radiation travels through the lunar vacuum in the form of light. Hence, observers must be sufficiently distant from the explosion if they do not wish to experience severe burns on less insulated parts of their bodies.

● Can a large future atomic explosion set off on the moon be seen on Earth 235,000 miles away? Yes, quite brilliantly, if it occurs on the unlighted part of the moon, i.e., soon after a new moon or when it is in its first quarter. Even at full moon we will be able to observe it well, as the atomic flash is more than a thousand times brighter than the moon's illuminated surface.

P O T P U R É E

Abridged

When a man gets too big for them, he should burn his britches behind him.

Avoirdupoison

Completely chastened will be the obnoxious who habitually throws his weight around, when on a visit to outer space finds that he weighs nothing!

Subtraction

2 and 2 do not always make 4. Thus 2 kisses and 2 hugs may make 1 black eye or 1 divorce, if the kisser picks the wrong wife.

Daffynition

Scientists are crazy people who become eminently sane when the world suddenly understands them.

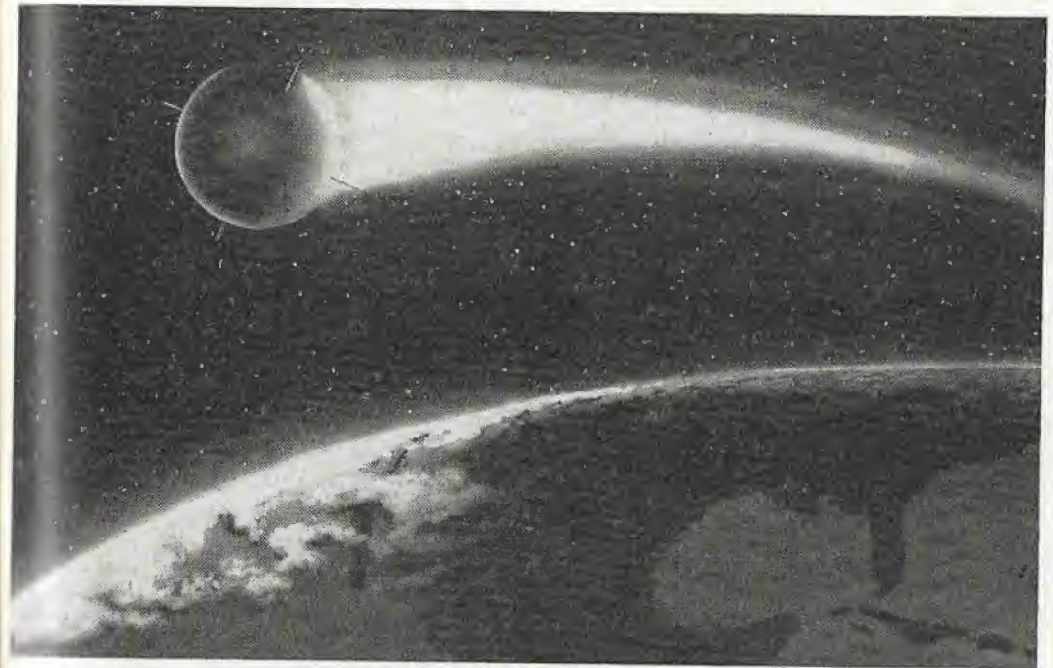


THE SATELLITE COMET

As most of us are aware, 1958 has been designated as the year during which, according to Prof. Homer E. Newell of the U. S. Naval Research Laboratory and Dr. Joseph Kaplan, chairman of the U.S. National Committee of the International Geophysical Year, between 6 and 10 space satellites will be launched by the United States.

These artificial moons will be shot into space by means of multistage rockets to beyond the terrestrial atmosphere, where they will gravitate around the Earth in various orbits from 200 to over 1000 miles above the surface of our planet.

These satellites are small, measuring but 18 to 20 inches in diameter—the size of a beach



Man-made Earth Satellite with electrically energized comet tail as it would look 300 miles up. Tail is flashed on and off from Earth.

ball. The little moons will speed around the Earth once in about 100 minutes. The closer their orbits come to the Earth, the faster they must travel. Hence, their speed must be high, over $4\frac{1}{2}$ miles a second, or from 16,800 to 18,000 miles an hour.

● The man-made satellites are pure instruments of science to explore not only our upper atmosphere but outer space as well. If we are ever to venture beyond our atmosphere in manned spaceships, we must know many things that puzzle us now. We are like deep-sea fish that have never ventured to the surface of the ocean and for hundreds of millions of years we have lived at the bottom of our thick atmospheric blanket.

We know that outer space holds many unknown dangers for us and physical conditions about which we know but little. Chief among these are various powerful radiations such as ultra-violet, infra-red, cosmic, X-rays, radio and perhaps other unknown ones. The Sun as well as the stars bombard outer space, not only with powerful radiation, but with a "corpuscular" energy—finely divided matter—highly charged with electromagnetic energy.

● Space itself abounds with charged electrons and atoms—

from hydrogen to other more complex atoms. Solar light, too, presents problems in outer space, all of which have not as yet been solved. Protected by our beneficial thick blanket of air, some of the outer radiation never reaches us. What will be the effect of the most powerful of these Sun rays—X-rays, ultra-violet and other atomic radiation—on man in outer space? The Sun in reality is a titanic atomic bomb, functioning continuously through its history of many billions of years. The Earth, but 93 millions of miles distant, gets a fair share of this vast atomic bombardment. What is it like for men to face it unsheltered without the protective blanket of air?

The Earth satellites have been created precisely to answer these questions as well as many others. Crammed full of instrumentation of all types, they will give us a full account of outer space and its mysteries. From such new knowledge we will learn under what conditions and with what safeguards man himself can finally venture into outer space.

Outside of this, scientists will learn many things about our universe that will benefit mankind in undreamt of directions. Solar power on Earth, electrical power direct from the atom, are but two of many challenging problems that could possibly be solved from

better knowledge gained through unraveling outer space secrets.

● But let us return to our satellites for a moment. One of the problems that has been bothering our scientists is the difficulty of visually observing a satellite once it is launched in its orbit. Remember, it travels at the average rate of, let us say, 17,000 or more miles per hour. At such a speed, the tiny speck, less than 20 inches in diameter and 300 miles away, can barely be seen even with a telescope. At night, in the Earth's shadow, it cannot be seen at all. It may be glimpsed for short periods—at dusk and dawn—when conditions are right, but that is all. Yet scientists would like to see it continuously, if that were possible, particularly at the start and at the near-end of its flight before it crashes to earth or into the sea—or vaporizes in the dense lower atmosphere.

True, by the telemetered radio signals which it emits at command from Earth stations, the satellite's general direction is known but for many reasons visual observation, by means of motion pictures recording its flight, for instance, would be of great advantage.

This, I am certain, can be accomplished in a manner so far not proposed, to the best of my knowl-

edge. My proposal will add but a trifling expense to the project.

● The plan, in simple terms, is this: *To give it full visibility, make the satellite an intermittent, flashing comet at the same time.* Technically, there is no difficulty in accomplishing this, as the physics of comets has been fairly well understood for a long time.

Comets, as textbooks on the subject reveal, have an exceedingly small head (the nucleus) and mass. Without their spectacular tails probably most of the comets would never be observed. The cometary tails spread hundreds and often hundreds of thousands of miles behind the nucleus of the comet, yet curiously enough, the tail itself is so thin and tenuous that it has very little substance. Stars can be readily seen through it. We know today that such tails are mostly gaseous, composed of carbon monoxide, cyanogen and hydrocarbons.

● What gives the comet's tail its great luminosity? Sunlight is partly the answer. Yet a comet's tail also shines by its own light by electrical excitation. How such electric action originates, however, is not well understood by scientists. Scientists know also that gravity has little effect on the tail. A comet's tail is always

turned away from the Sun, no matter in what position the head is at the moment. It is believed that the radiation pressure of sunlight turns the tail away from the Sun, just as a weathervane turns away from the direction of the wind. But the spreading of the tail and its own luminosity seems to be an electrical effect. Moreover, miniature comets have been demonstrated in the laboratory since 1876!*

● Taking advantage of these facts forty-five years ago, I created an artificial comet in my science-fiction novel "Ralph 124C 41 +." To camouflage the whereabouts of his spaceship from his adversary, the hero turned it into an artificial comet! Here is how the book described the trick:

"As comets' tails are composed mainly of hydrogen gas, and dust,

*In 1876 Reitlinger and Urbanitzky, before the Vienna Academy of Sciences, reported on their experiments with artificial comets. A tube containing hydrocarbon has been pumped out till the pressure has fallen to 0.1 millimeter. If it is connected to an induction coil, a blue sphere which "hangs" suspended freely will be formed at the positive electrode after a short time. Connected to the sphere is a tail (Fig. 1). One is struck immediately by the close resemblance between this artificial comet and that of Henry's Comet of 1873 (Fig. 2). If a conductor (a brass ball) as seen in Fig. 1 is brought near the tube, the tail flees from the conductor as far as the tube allows. This again proves that artificial as well as real comets are subject to the same natural laws. As is known, the tails of all comets are repulsed strongly by the Sun, which is nothing but a conductor.

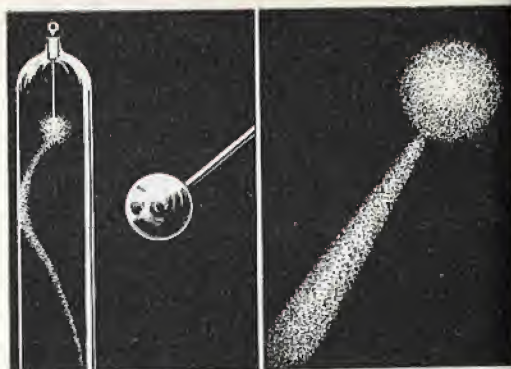


Fig. 1.
Text at lower left.

Fig. 2.

the creating of Ralph's artificial comet was simple for the scientist.

"By means of scraps of zinc and iron filings over which sulphuric acid was poured, Ralph produced a great quantity of hydrogen. . . . As soon as the stopcock in the wall of the space flyer was opened, the hydrogen rushed out [into space from the tanks].

"Immediately Ralph connected the high frequency apparatus with the outside aerials of the spaceship and the phenomenon took place.

"The hydrogen particles which heretofore had been invisible began to glow with a wonderful light, enveloping the entire flyer."

So much for the science-fiction aspect of the problem.

● In practice the comet formula for our satellites would not change overmuch from the above. The inside of the satellite would

be pumped full of a suitable gas, preferably one of high luminosity such as neon or sodium, or a combination of a number of gases. The gas would be puffed out in short bursts from the rear of the satellite, by electronic control from Earth. Thus the compressed gas would last a long time. It probably would be necessary to include a small, light, high-tension induction coil,* battery- or solar-electric operated, in the satellite to illuminate the tail for night observation when the satellite-comet swept around the dark side of the earth. The induction coil would be turned on only momentarily when puffs of gas were expelled. To save the very vital electric current, the tail would not be illuminated constantly—it could be flashed on for perhaps a second at a time by

*A compact high tension induction coil giving 7,000 to 10,000 volts can be built today weighing less than $\frac{1}{4}$ pound.

telemetric control from Earth when passing over the various observation stations scattered along the route of the satellite.

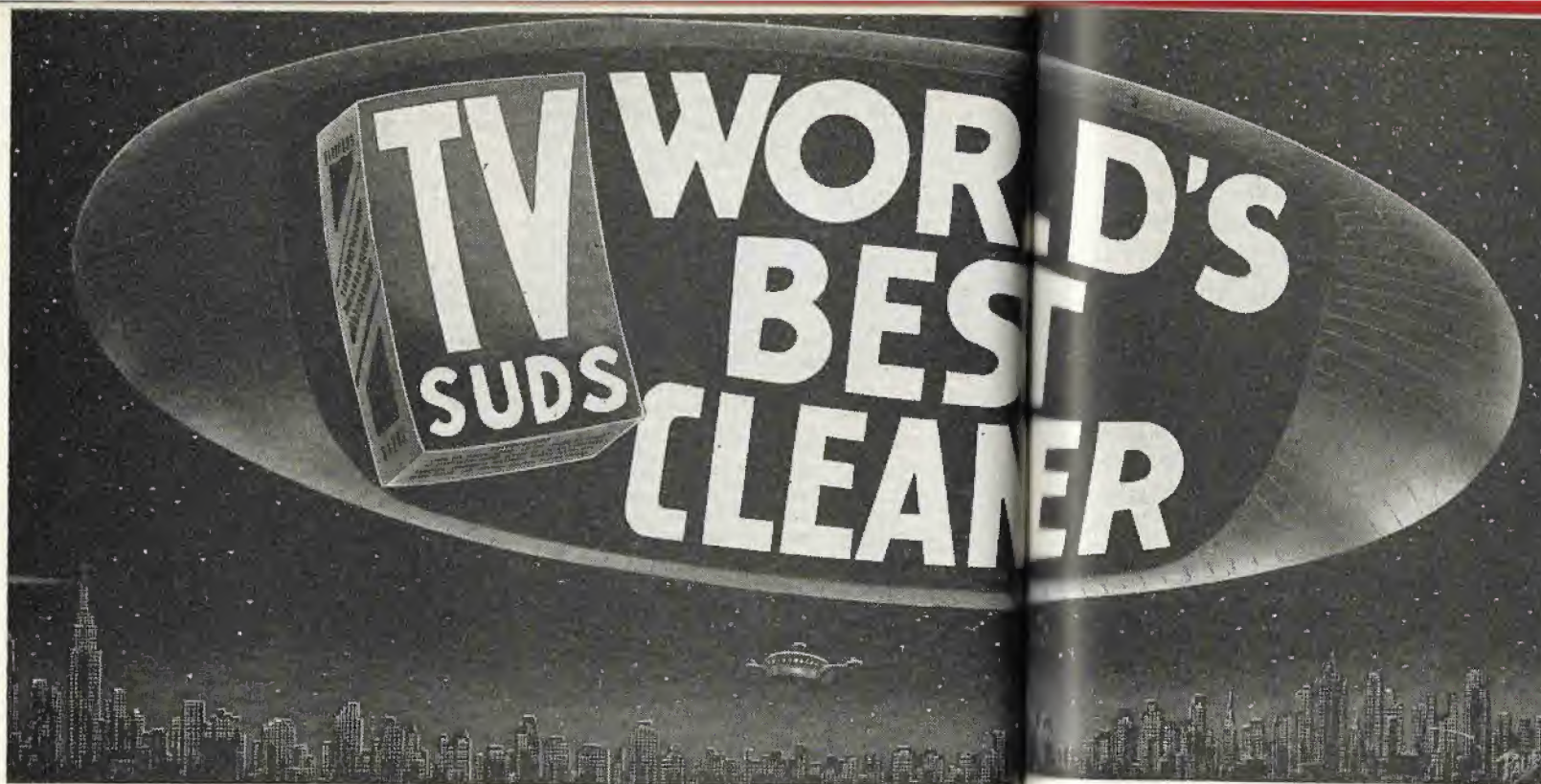
● It is quite possible that during the daylight orbiting the satellite-comet would be quite visible, particularly before its rising and setting periods. It probably could be observed with the naked eye as its tail should extend for a fair distance.

● During a clear night, however, while the comet would be flashing its tail on and off, nearly half the hemisphere's world population would be able to see the first man-made spatial celestial object clearly. Scientific observers, too, would have a field day for accurate visual observation and for photographic records.

I wish to acknowledge with thanks several valuable suggestions made by Dr. Donald H. Menzel, director of the Harvard College Observatory, who was kind enough to read the proofs of this article.

TO OUR READERS

FORECAST 1957—like its many other predecessors—is the annual Christmas Card of publisher HUGO GERNSBACH. Over 7,000 copies have been printed for the publisher's friends in and out of the radio, electronic and television industry. Please do not send money for extra copies—the booklet is NOT for sale. Requests for single copies of FORECAST 1957 can be filled only as long as the present supply lasts. Quantity orders cannot be accommodated.



Colossal sky television ad, 60 miles in diameter with letters 25 to 35 miles high. The sign—an Earth satellite—revolves around the Earth. This huge sky sign is lighted from a second

WHILE television has been with us for a long time—the writer wrote the first technical article, “Television and the Telephot,” in the December, 1909, issue of *MODERN ELECTRICS*—it was also very crude in those early days. Television

as we know it today did not become a practical reality until the years immediately following World War II.

Up to very recently we had only monochrome television. Today we have full-color receivers and we can look forward to the im-

mediate future when multicolor sets will become as common as the present black-and-white receivers.

What of the more distant future? In what direction will television travel? From today's

technical viewpoint we can forecast a number of developments which are certain to come.

Yet it is necessary to understand that in technical forecasting it is never safe to predict exactly how long it will take industry to catch up with the forecasts. There are too many imponderables, too many obstacles in research, in finances and in manufacturing. There is always a long and weary road between prediction and reality.

● Three-dimensional TV has long been predicted by the writer and others. Much research has been done in this branch and many patents have been granted. It is a certainty of the future.

● *Picture-on-the-Wall TV*, first forecast by the writer in 1954,* is also a certainty in the not-too-distant future. The heavy cumbersome TV sets of today are doomed to extinction, chiefly because they take up too much room in the modern and future home. Most TV manufacturers are

*See *Radio-Electronics*, January, 1954, issue, page 33.



TELEVISION OF THE FUTURE

working intensely on this problem now.

● *Electronoptics* is a new concept of which you may hear a great deal in the future. It will be linked intimately with a radical re-evaluation of all present-day TV. For over three decades now the writer has been speaking of *scanless* TV. The animal eye, as we have reiterated constantly, is still by far the best TV receiver. It is also the smallest, the most compact, the most efficient and the lightest. The eye does not scan—it requires no huge cathode-ray picture tube. It works by chemico-electronoptics. Now we know that the electromagnetic spectrum has radio waves in one section, which then gradually merge into a high-frequency region where the electro-radio waves become light rays—the optical part of the spectrum.

It is the writer's contention that the cumbersome instrumentation now used in our TV sets will be replaced with much simpler electronoptical means in the future. Why? Let us see how TV sets work today.

● First we receive the waves (impulses) from the transmitter. We then amplify these impulses and convert them into modulated cathode rays via the picture tube. These rays then influence cer-

tain chemicals (phosphors) on the TV tube's screen, giving us light impulses which we require to perceive the picture.

This roundabout system can be enormously simplified once we have mastered the intricacies of electronoptics. The cathode-ray tube will not prevail in the future. It is far too cumbersome and too complicated. Exactly how will electronoptics solve the problem? There may be scores of methods. Let us hint at only one.

Semiconductors of the future, i.e., transistors combined with atomic luminescence, look attractive. Remember, transistors are still in their earliest infancy—you can expect great and astonishing, as well as revolutionary, advances from them in TV.

● *Celestial Television*. 1957-58 marks the International Geophysical Year, during which man's first space vehicles, the artificial moons, will be launched.

This step emboldens us to look farther into the future and into the realm of the really spectacular television now on the horizon.

Few people realize what fantastic sums are spent in the United States for television advertising and for night advertising in illuminated billboards, neon signs and other forms of luminous advertising. It runs over \$500 million a year.

What would advertisers not pay to get on a monster sky display sign, measuring 60 miles across, with letters from 25 to 35 miles high? And to top it all, an ad that would be seen nightly (clear skies permitting) by nearly the entire country, plus the rest of the entire hemisphere? This idea is not only feasible, but eminently practical and could be accomplished in 15 years or less.

For the technical data, we refer the reader to the article of Hermann Noordung, AD., M.E., "The Problems of Space Flying," published in the September, 1929, issue of *SCIENCE WONDER STORIES*, a former Gernsback publication. The article treated of a monster spatial mirror, 60 miles in diameter and floating from 200-400 miles above the Earth, invented by Professor Hermann Oberth, the great German mathematician, one of the scientists responsible for the World War II V-1 and V-2 rockets.

This mirror in reality was, and still is, both a peace and war weapon. Concentrating the Sun's rays like a burning glass, it could vaporize the world's biggest cities by its titanic inherent power. By heating the upper air strata the weather could be changed at will. Ice-locked rivers or lakes could be melted rapidly.

This immense space mirror will probably be built in the not-

too-distant future with a new incentive not thought of by its distinguished originator Dr. Oberth—*night television*.

The mechanics of the Oberth mirror would remain the same. About 60 miles in diameter, it will be built by spacemen, using prefabricated thin aluminum girders, 200 to 700 miles up. As the mirror floats free in space, the structure can be extremely light—a mere spiderweb. The mirror part itself is made from paper-thin squares of the silvery white metal sodium. It is cheap and has a high luster, reflecting light perfectly. Floating in a good vacuum, sodium cannot tarnish. It will last for years.

The mirror slightly concave—i.e. dished—toward the Earth is in fact a satellite, making one complete revolution around the Earth in about 2 hours and 35 minutes. It never stops revolving, unless destroyed.

● Some distance below the center of the mirror's face—toward the Earth—anywhere from 25 to 30 miles distant, we have another but much smaller satellite—the projector. This can be the usual near-saucer type and need not be larger than 100 feet in diameter. It houses the crew, radio and television equipment. The crew also services the mirror 25 to

(Continued on page 31)

The Electronic Doctor



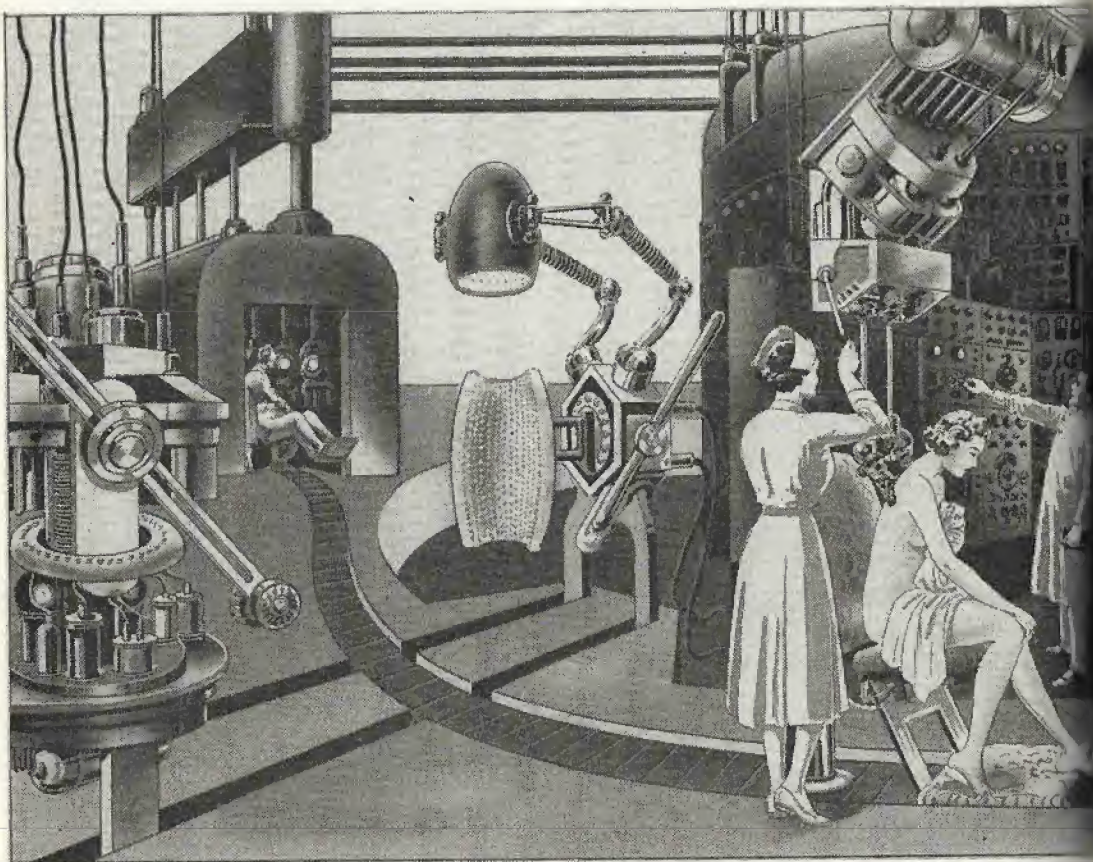
WHEN, over 2,300 years ago, "The Father of Medicine," Hippocrates, began to practice, much of his work was, at best, an art. To this day, many branches of medicine are still not a science. Much remains "hit or miss," and a great deal of treatment is by intuition on the part

of even the best physician. Why is this so? One of the important reasons is that the body's interior is not accessible as is a machine's, and that the workings of the body, especially its cellular chemistry, is so inconceivably complicated, the more we learn of it the more complicated it be-

comes. You cannot take a patient's body apart as you can a machine. Hence you cannot see inside it to make a correct analysis of every organ, particularly the deep-seated ones. Nor can the physician go wholly by symptoms—deep-lying cancers, for instance, seldom give a warning. When,

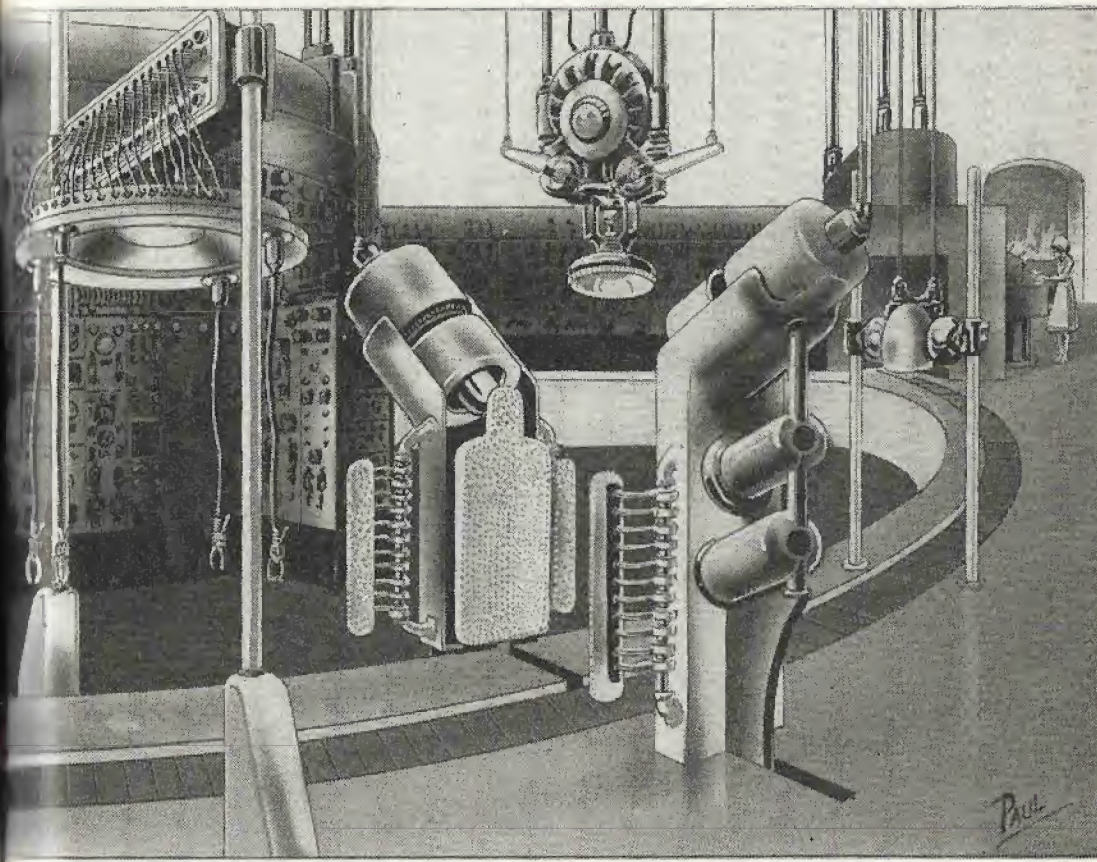
after the disease has made its inroads, the cancer is finally discovered, it is often too late.

● What medicine needs urgently today is a new concept of diagnosis, a strictly scientific and modern *armamentarium* that does away with present-day guess-



The Electronic Doctor will assist your doctor to get fast and accurate analyses on his patients. Every imaginable test will be made by this machine.

FORECAST



After you have been processed, an electronic brain will run a complete record of your case on a tape which goes to your doctor.

1957

work. Such instrumentation would give the physician a tool which he never has known and which will place medicine on the high plane it deserves.

The way I imagine this innovation is as follows. A complicated electronic testing and analysis machine coupled to a special electronic computer (brain) is to be evolved. It can almost be built today from existing means, but must be steadily improved as new discoveries are made.

Due to the great cost of such a machine, it would have to be installed in hospitals or medical centers. Or it could be run and operated by a group of special diagnostic physicians.

● The purpose of the machine is purely analytical—it only analyzes and diagnoses patients sent to the center by their physicians.

As each patient is processed, the "Electronic Doctor" prints the diagnostic results on a tape in symbols. The final result comes from the computer—a complete evaluation of the findings on the subject-patient. The latter now returns to his own physician with a most comprehensive report.

The machine does *all* the routine work which physicians do now, such as ultrasonic testing, taking temperatures, but in *various parts of the body*, not just in one or two parts. There are also

various blood tests, metabolism tests, percussion (tapping) tests, heart soundings, electrocardiographs, blood pressure and dozens of others, that is to say, a complete "Physical."

To speed the work, the "Electronic Doctor" will have several human physicians or nurses in attendance who guide the patient.

● Now come the electronic tests, beginning with *total* X-rays, not just one part of the body, but the *entire* body in 2 or 3 different positions.

For some time now, I have insisted that, aside from X-rays, it is possible with *proper* equipment to *transilluminate* the entire human body, and in fact "look" through it with actual light, and photograph every interior organ. (See FORECAST 1954 and SEXOLOGY, May, 1954.)

By using a light source of many millions of candlepower, an intense light spot can be focused on any part of the body. The light is first filtered to rid it of all heat, so only cold light transilluminates the body. *If there is any tumor, it will show up in the photograph.* If now a transillumination record is made of the entire body, most diseases will be revealed in the photographs. To succeed in this method, far more sensitive photographic emulsions must be first developed.

Such analysis is particularly important in connection with the reproductive glands, i.e., uterus, ovaries, prostate, testes. This is true also of the abdomen, lungs, heart, etc.

● Electronic tests not made at all today are *conductivity* and *capacitive* ones. When we are young, electrical conductivity both *of* or *through* the skin and various parts of the body is high. As we grow older, the conductivity decreases. This holds true of the inner organs, blood vessels and the blood itself. But there are wide variations, which to my best knowledge have never been investigated, *between* various diseases. *There exists a connection between electrical conductivity and diseases.* It merits a great deal of research.

Exactly the same conditions exist when we measure the *capacitance*—the dielectric factor—of various parts of the human (animal) body. We do know that the capacitance of these parts varies widely in health and in disease, but little about this field is known. Much research remains to be done here too.

● I do not wish to tire the reader with scores of other electronic tests which the "Electronic Doctor" will make on every patient, because as time goes on hun-

dreds of new ones will be devised, unknown and undreamt of today.

The important message I wish to convey is that in the future the "Electronic Doctor" will take much of the present guesswork out of medicine and make it the important science it deserves to be. Then, if every citizen is required by (a new) law to take annual "Electronic Doctor" tests, it becomes axiomatic that the future over-all health of all inhabitants must not only rise sharply but that much misery, pain and money now lost through sick leave will be saved.

● I do not wish to imply that the electronic doctor will ever do away with physicians. On the contrary. The "Electronic Doctor" can never be anything more than a diagnostic tool. It will be of incalculable value to every doctor in lightening his arduous task in the pursuance of scientific methods in medicine.

Moreover the machine's information must always be evaluated and supplemented by other known data of the patient by the physician. Then too, certain parts of the body may not be the same 12 or 24 hours after the machine test—for the body is a living entity subject to rapid changes. Only the patient's doctor can evaluate the body's true condition and state.

THE RIDDLE OF SEX

POSSIBLY the most amazing fact about sex is the extraordinary attitude of humans toward it.

Although the sex act is a natural and universal function, without which our planet would be a lifeless world—nearly everything connected with sex is despised, ridiculed or met with shamefaced mien and raised eyebrows by our self-proclaimed civilized races.

What should be the loftiest of all human expressions, and the most revered, is dragged through the mud and treated with outrageous ribaldry.

● Why do intelligent humans act in so astounding and wholly incomprehensible a manner when it comes to sexual matters? The answer is quite complex and cannot be given in a short sentence. Curiously enough, if we analyze the problem as it pertains to mod-

ern man, we find that *sex is rarely an object of levity if it concerns ourselves—the levity is almost always directed at someone else*, just as our risibilities are aroused when we see a dignified person slip and fall on the pavement. We are NOT amused when it happens to us.

From this it would follow that man constantly tries to impress his fellow man with his dignity. Foolishly, he often thinks that sex is a sign of weakness and therefore not dignified. Hence the misplaced levity.

Most aborigines take sex life in their stride. To them, sex is what it should be—a natural function like eating or drinking. The same is true of most of the animal world.

Modern *homo sapiens*, man, instinctively wants to hide every sexual function, so much so that it has today become a devastating phobia responsible for many of man's neuroses.

To find further reasons for our strange behavior we must go back many millions of years to our earliest cavemen ancestors. In those days most of man's body was covered with shaggy hair. His sex life did not differ much from that of the quadruped mammals which surrounded him and with which he was in intimate contact. Sex was as natural to him as hunting—he probably

never gave it much conscious thought—since instinctive action was his main motivation in those dawn ages.

Ever so slowly over a span of hundreds of millenia of years there came a subtle change. Various new forces were now acting on our hairy ancestors. More and more, man forsook the forests and caves for the plains and open country in search of food. He became a nomad. In the open spaces in warmer zones, his thick, furry skin became a distinct handicap. In the torrid summers some human species began to shed hair, as do many animals. Then slowly through the ages and by sexual selection, many human beings began mating with less shaggy specimens, who appeared more



"Alalus Europaeus" . . . ("Pithecanthropus alalos") painted by the renowned German artist Gabriel Max, after suggestions by anthropologist Karl Vogt. This painting of early man shows his protective thick matted hair.

desirable. They probably were fleeter of foot and were not winded as fast as the more hairy ones.

Quite likely there were other reasons which science has as yet not unraveled that contributed

to making man less and less hirsute through the ages. One of the most compelling no doubt was a very practical "survival compulsion."

● In the dense primeval forests and in the deep caves—the habitat of dawn-man—the light was always poor. Seeing and observing were difficult most of the day, far worse at night. The hunter could not distinguish between his own species and the beasts, hence many hunters were killed mistakenly for animals. This made a deep and lasting impression on the survivors and, as with all species, man strove unconsciously to change his appearance in his battle for existence.

Just as the brown rabbit changes his fur to white at the onset of winter for his protection and survival in the white snow, so through evolution man shed his heavy fur for lighter and thinner coverings, till finally there was no fur at all—only a sparse bodily hair cover. This evolutionary process is still going on in modern man—there are still males and females who have a fair amount of body hair.

● Let me cite a case which came to my attention a few years ago and which speaks for itself. A very fine-looking Southern gen-

tleman consulted me in connection with a divorce action threatened by his wife. It appears that there had been a whirlwind "love-at-first-sight" marriage after only a week's acquaintance. But his bride left him after a three-day honeymoon. The reason? The husband had as heavy a matted, hairy front and back as I have ever seen. His wife was, as he put it, "so horrified and frightened" that she could not face him any longer.

● Why did she act thus? Instinct inherited over a span of hundreds of thousands of years dictated to her that this man was not her equal—he was a "hairy animal." Her inborn mechanism of sexual selection came to the fore and—*she rejected him.*

But let us go back to our dawn-age hairless—or nearly hairless race. Man had now begun to climb the long road to what we are pleased to call "culture." He also had become more observant and his "thinking processes" had become more acute. The winters were quite cold even in the temperate zones, so man began to use animal skins and furs to keep warm. These he discarded when spring and warm weather came. He kept only a loin cover or similar device which he needed as a vital protection while hunting and fishing.

● Many thousands of years later—after the last ice age—when he had learned to weave fibers, man took to more and more bodily covering, till finally a good deal of his anatomy was covered and stayed covered.

During this long evolutionary stage, a new emotion had gradually made itself felt in man—*shame*—particularly the shame of total nakedness. He now became conscious of the fact that somehow he had risen above the animals, but he no longer was as unthinking as he was when he roamed the plains nearly naked. He knew now that he was *different* from other mammals and he began to reason that he was *above* them.

Too, the insecurity which he felt in the nude state made a powerful impression on him, which proved cumulative during succeeding generations. Exposing oneself became shameful and degrading; hence, sexual functions, directly linked to nudity, came under the same taboo in our so-called civilization.

In most aboriginal societies—when left alone and uninfluenced by the "civilized" races—nudity is the rule. There is, consequently, no shame-emotion connected with nudity *per se*—and sex is treated in a matter-of-fact way. Sex functions are not ridiculed and thought obscene. Indeed, most

aborigines do not understand obscenity. Modern man, as we said at the beginning of this article, finds it difficult to discuss sexual topics with his fellow-men in a serious manner. Levity invariably crops up, particularly among laymen.

● Why is this so? Obviously, only because the average man (or woman) has only the most superficial "education" in sexual matters—if any at all. Nearly all so-called "sex education" in our present society goes back to our earliest childhood, long before our teens. *It is then that the deepest impression is made.*

Childhood beliefs in matters of sex are the most difficult to eradicate. Most of us are conditioned in much of our adult sex patterns before we are six. We listen avidly to the childish fantasy-prattle of our young friends or buddies, particularly if they are a bit older. No matter what nonsense they are teaching us, we believe them far more implicitly than the hard-to-understand ponderous things our unsure-of-themselves parents try to impress us with, if they talk to us at all on that subject. As we grow up, if we are average humans, we absorb more weird "knowledge" from our friends. It is true that when we come of age we *may* acquire some books on sexual subjects,

but it is equally true that we rarely read them attentively from cover to cover. Most of us skim through them, because our old taboo—shame—subconsciously prohibits us from reading certain chapters. Anyway, *we know all about sex*, have known all about it since childhood, so why cram such nonsense into our heads?

● And that is precisely what makes man's attitudes toward sex so incongruous today—the universal ignorance of what sex really is from a scientific point of view.

The overwhelming majority of people everywhere have no conception of the great complexity and the tremendous range of sexology. They see sex only as a bou-doir topic, never dreaming that thousands of researchers all over the world are discovering new and unsuspected sex facts every month in the laboratory and elsewhere.

This snobbish ignorance of sex often extends even to the so-called educated classes, although most educated persons will scoff at such a possibility. You can easily convince them of their error with the following questionnaire. If they can answer 20% of the questions correctly, they will indeed know far more than the average educated person about sex.

QUESTIONS

1. How can a girl become pregnant yet remain a virgin?
2. What is a stone baby?
3. Do men actually suckle and nourish infants?
4. Can one beget children years after death?
5. What are transvestites?
6. Why do some boys become pregnant?
7. Why are girls in some primitive tribes circumcized?
8. How often are twins born, one black and the other white?
9. What is phantom pregnancy?
10. Is fatherless birth possible?
11. How rare are children with tails?
12. What is telegency?

Here are the answers:

● *Answer 1.* According to the late Dr. Maxwell Vidaver, it is an established and incontrovertible fact that impregnation has taken place in women with unbroken hymens, when penetration of the vagina had not been accomplished. Such cases have been recorded in medical literature, from time to time. Although conditions must be extremely favorable for impregnation to occur in such a manner, it has happened. All hymens have perforations through which live male semen, *deposited on the outside of the female genitalia, can enter into the vagina.*

● *Answer 2.* Dr. Eugene B. Mozes explains "stone babies" in this way. "Stone babies" are always found in the free abdominal cavity and not in the womb (where normal pregnancy develops). Here is how pregnancy outside the womb, or *ectopic pregnancy*, takes place. Fertilization takes place in the fallopian tube, where the male and female sex cells are united. The fertilized egg then moves to the womb, where it develops. Sometimes, however, an accident happens following fertilization. Instead of traveling to the interior of the womb, the fertilized egg remains in the fallopian tube and becomes attached to its wall.

Sometimes an abdominal pregnancy is not recognized in time. In such cases, the baby dies and is retained in the mother's body indefinitely.

Often excess amounts of lime salts may be deposited on the calcified fetus, increasing its weight. Thus a "stone baby" is not stone at all. Ages ago, before much was known on the subject, this misnomer originated and the ignorant still believe in the term.

● *Answer 3.* Impossible as it sounds, the late Dr. Max Bartels, Ph.D., famed anthropologist and anatomist, of the University of Berlin, related a number of cases where men suckled infants.

"Some medical observers," he wrote, "have reported a number of instances of milk-secreting breasts in men. Dr. Schenk knew a man who secreted a rich supply of milk from youth until his 50th year. Dr. Walaeus gives a similar report of a Flemish man of 40 with one enormous milk-producing breast.

● *Answer 4.* Human spermatozoa have been successfully frozen and preserved. A recent report discloses that three American babies have been born of women who were artificially inseminated with frozen human sperm. The babies were reported to be perfectly normal and healthy. This epoch-making event was announced by Dr. R. G. Bunge, University of Iowa urologist. Scientists now believe that human sperm can be stored for many years without deterioration; *hence a man can now have offspring years after his death.*

● *Answer 5.* Says Harry Benjamin, M.D., endocrinologist: "Transvestism is the desire to dress in the clothes of the opposite sex. This term, first used by Dr. Magnus Hirschfeld, has the disadvantage of naming a disturbance of behavior and emotion after only *one* of its symptoms, although the most conspicuous one. This symptom, which is

also known as 'cross-dressing,' is the symbolic fulfillment of a deep-seated and more or less intense urge indicating a disharmony of the sexual sense, a sexual indecision or a disassociation of *physical* and *mental* sexuality. Few transvestites are homosexuals."

● *Answer 6.* Pregnant boys, while rare, are now well recognized by medicine. One case of a pregnant boy was described by Prof. M. Lombard of Algiers to the French Academy meeting in Paris on Nov. 25, 1953. Occasionally a male child is born, apparently normal, yet bearing in his abdominal cavity a little twin which he had absorbed during his fetal career. A few cases live on, apparently normal in health, till adolescence brings with it a rapid and intensive growth. The change is caused by the increased amount of the internal secretion of the testes (male sex glands). The miniature hidden fetus, which has been feeding all the time on the blood supply of its big brother, receives its share of the testicular secretion. It also responds by intensive growth, and soon an abdominal tumor is diagnosed. An operation reveals it to be a type of *teratoma*; not always a complete human body, but clearly recognizable as a separate human being. There does not seem to be any record of such

an operation resulting in the surgical birth of a child who remained alive. An excellent specimen of this abnormality was dissected and is preserved in the Hunterian Museum of London.

● *Answer 7.* Female circumcision has been practiced for ages in many parts of the world. This is what Professor Denise Paulme, head of the African Department of the *Museum of Man*, and professor of the Institute of Ethnology of France, says on the subject: "Clitoridotomy, or female circumcision, with its accompanying ritual, is a major event in the lives of the girls of the *Kissi* people who inhabit Upper Guinea (on the west coast of Africa). It is initiation into adulthood and is almost always immediately followed by marriage, betrothal having taken place a long time before. To evade this painful operation is an invitation to social ostracism."

● *Answer 8.* Dr. John Archer (the first physician to receive a medical degree in America, in the year 1810) relates that he confined a *white woman*, delivering her of twins, one of which was *black* and the other *white*! The woman informed Dr. Archer that she had had relations with a white and colored man, respectively, *within a short period*

of time. This may appear impossible, but it is confirmed by other cases on record of a similar nature; few, it is true, since few women will make such admissions!

● *Answer 9.* Phantom pregnancies are well documented in medicine. They are not rare. Let us listen to Dr. Eugene B. Mozes: "Phantom or *spurious pregnancy*, sometimes called *feigned* or *hysterical pregnancy*, is one of the greatest medical curiosities. Known scientifically as *pseudocyesis*, it is a condition in which the woman firmly believes that she is pregnant and develops the usual characteristics and distinguishing signs of pregnancy without being pregnant at all. She misses her periods, or they become extremely scanty, and her abdomen swells gradually as it would in ordinary pregnancy."

The signs sometime deceive even a physician on superficial examination, as her abdomen may appear as large as that of a woman 8 or 9 months pregnant. Almost every one of these women "feels" the movements of the "baby" and some of them actually go through labor pains.

Hippocrates, the "father of medicine," some 2,300 years ago described 12 cases he had observed. One of the most interesting cases in history was the

imaginary pregnancy of Queen Draga, the wife of the last king of the Obrenovitch dynasty of Serbia. The Queen's desire for an heir was so strong that she finally persuaded herself she was pregnant. The famous Professor Snygirov, who was summoned from Russia, had great difficulty in convincing the Queen that she was a victim of pseudocyesis. Up to the present time, 465 such cases have been described in medical literature.

● *Answer 10.* Virgin birth must be given serious consideration and study, said Dr. Stanley Balfour-Lynn in the English medical journal *The Lancet*. He was discussing the assertion of a British woman who claimed that her eleven-year-old daughter had no father. Dr. Balfour-Lynn stated that investigation had been unable to disprove the mother's claims. All of the evidence obtained is consistent with what would be expected in a case of *parthenogenesis* (reproduction by development of an egg without fertilization by a sperm).

Parthenogenetic development going full term and producing live and healthy offspring can be induced in mammals by cooling the fallopian tubes; *many fatherless rabbits have already been produced by this technique.*

The time may come when hu-

man eggs can develop into babies without fertilization by a male sperm. However, up to the present time, the possibility of this process taking place in human beings has not been conclusively proven.

● *Answer 11.* Humans with tails are well authenticated throughout medical history. Nor is the extra appendage too rare. Dr. Maynard M. Metcalf, professor of biology in the Woman's College at Baltimore, in his work on *Organic Evolution*, states (page 163): "It is interesting to know there have been instances in which a human being has retained, in an abnormal condition, the muscles of the ancestral tail."

The American Text Book of Surgery calls attention to the occasional births of children with tails, and suggests their early removal by surgery. From an embryological standpoint, every human being begins life with a tail. Strange as it may appear, the unborn child, in its development in the womb, passes through many phases of evolution. In the first half of the second month of life in the womb, it does not differ essentially in appearance from other animals!

ON THE COVER

Brook's Comet, from photograph by E. E. Barnard, at Yerkes Observatory, Oct. 19, 1911.

● *Answer 12.* Telegony is defined by the authoritative *Gould's Medical Dictionary* as "the influence of a previous husband on the children of a subsequent one [husband] through the same woman." In Germany during World War II men were warned not to marry widows on account of the possibility that the offspring of the second husband might be "tainted" by the first husband.

While a controversial subject, as far as humans and their offspring are concerned, there is little controversy in zoology. Says the great Charles Darwin: "Careful breeders avoid putting a choice female of any animal to an inferior male on account of the injury to her subsequent progeny which may be expected to follow. . . ."

● These are just a few random facts to illustrate that vast subject of sexology which still baffles modern humans, as it did their prehistoric, less learned predecessors. Does it not behoove man to take stock of himself and ponder that ancient truism of Plato, uttered by that great philosopher over 2,300 years ago: "*Know thyself!*"

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TELEVISION OF THE FUTURE

(Continued from page 17)

30 miles above their heads. To illuminate this giant 60-mile screen requires a great deal of power, but not as much as might be assumed. The reason: both mirror and projector are in a near-perfect vacuum, hence light transmission is nearly perfect, too.

The necessary electric illuminating power would be obtained from atomic energy.

Celestial-space television being especially geared for advertising, news, weather and other shorts—because of the very fast motion of the sky screen—no long programs are feasible. The programs can be transmitted directly from a number of Earth stations to the space projector, as the mirror passes over or near them.

The projector's meteorologists, too, can give advanced weather reports, due to their altitude.

Of great interest to the advertising fraternity are the *international advertising possibilities, inasmuch as sky television covers the entire world.*

● *The Television-Phone*, long predicted, already exists in laboratory models. It will become universal in the not-too-distant future. You may wish to call an important customer abroad, but you can't speak Turkish, let us say, nor he English. The

telephone company's language rectifier now also in the laboratory stage will translate both voices *instantly* by electronics. You may—after you read this—have some doubts as to whether your voice will really sound like you. Your doubts are justified. Your voice will *not* sound exactly like yours after electronic translation.

● *Pocket and mini-TV sets* are a distinct possibility for the immediate future. Even today such an (overcoat) pocket set could be built. People *do* want small portable receivers as is best shown by the boom of our "small" portable TV sets. While these are still fairly large, measuring about 10 x 9 x 12 inches and weighing 22 pounds, the trend is unmistakable. People *do* want desk and night-table TV receivers that can also be put in their overnight bag when traveling. We may be sure that future TV pocket sets will be very popular.

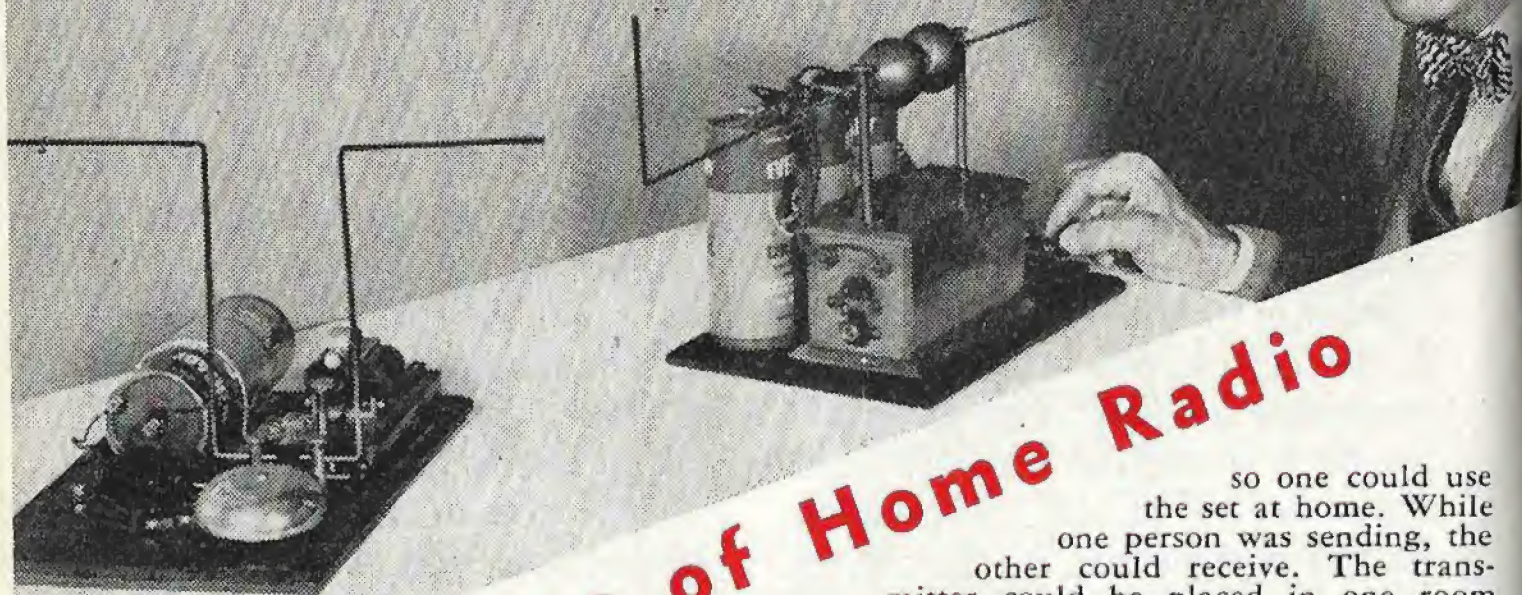
Still smaller minitelevision receivers are certain to be built in the future—just as will such tiny ones as television wristwatches, forecast by the writer in 1945. While still impracticable today, because of the necessary bulky cathode-ray tube, the problem is not unsolvable in the future.



WIRELESS TELEGRAPH

The "Telimco" Complete Outfit, comprising 1 inch Spark Coil, Balls, Key, Coherer with Auto Decoherer and Sounder, 50 Ohm Relay, 4 Cell Dry Battery, Send and Catch Wires, and Connections, with Instructions and Diagrams. Will work up to 1 mile. Unprecedented introduction prices. Agents Wanted. Illustrated Pamphlet.

ELECTRO IMPORTING CO., 32 Park Place, New York



50 Years of Home Radio

1955-56 marked the 50th anniversary of the first home radio sold anywhere in the world. Radio was not as we know it today because then there was no broadcasting. But wireless had been going strong for several years and amateur radio had just begun. Marconi and other pioneers were transmitting commercial intelligence by the dot-and-dash method.

The public knew little or nothing about wireless before 1905. As for a wireless home set, it had not been born. In 1903-04, Hugo Gernsback had been experimenting with a small portable transmitter and receiving set which he felt could be sold to the public. It had to be low in cost so that everyone could buy it.

Gernsback's ambition was realized in 1905. That year, he began to market the first home or private radio set ever sold, in New York City. As there were few wireless stations, it was necessary to sell a transmitter, too,

so one could use the set at home. While one person was sending, the other could receive. The transmitter could be placed in one room and the receiver would ring a bell in the other, without intervening wires.

All this was accomplished with the TELIMCO Wireless. The name is a contraction of the first letters of Gernsback's old pioneer firm, the Electro Importing Company (E. I. Co.), famous between 1904 and 1915—the first radio mail-order house in the world. In 1906 the little outfit went into quantity production and was sold through many large outlets in the U. S., including Macy's, Gimbel's, Marshall Field and F. A. O. Schwarz, the country's largest toy establishment.

This radio set was first advertised in the magazine *Scientific American* in the issue of Jan. 13, 1906. It was the first home radio set advertisement to appear in print anywhere in the world. (See ad.)

The complete set sold for \$7.50. The photograph shows an exact replica of the original outfit, to commemorate the 50th anniversary of the first home radio.

The historical set here described was acquired by the Henry Ford Museum of Dearborn, Mich. Donated by Hugo Gernsback, it will be permanently exhibited in the very elaborate radio section of the huge museum, beginning in April, 1957.

(Condensed from RADIO-ELECTRONICS magazine)